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THE CLIMATE OF AFRICA.

The Climate of the Continent of Africa. By Alexander Knox. Pp. xiv+552+13 maps. (Cambridge University Press, 1911.) Price 21s. net.

SUCH a work as this has not only become highly necessary, but should be in great demand amongst Governments, mining and commercial companies trading in Africa, missionary societies, and all individuals who intend to visit Africa for any length of time, or to settle in any part of that continent for purposes of health, science, education, or commercial gain. It is to be regretted therefore that the book on its first appearance should contain some needless errors and be chargeable with not a few omissions. And in the hope that some indication of these may be of use in the preparation of a second edition, it may not be thought ungracious on the part of the reviewer to point them out.

First, in regard to the spelling of African names. Nothing is more irritating to those who believe in the desirability of simplifying and standardising the orthography of place and tribal names in all those regions of the world (in other words, all aboriginal America and Oceania, and nearly the whole of Africa and Asia) than attempts on the part of authors to avoid conforming with the standard spelling of the Royal Geographical Society, the Indian Government, the Royal Asiatic Society, the African Society, and most Government departments and learned institutions which are qualified to pronounce an opinion on this subject, and to promulgate a fixed spelling for all parts of the world where no standard has hitherto existed. In some cases this official spelling, though logical as to the use of consonants and vowels, may not have been quite consistent with the original and most widespread native pronunciation of the name. For example, there is no doubt but that the late explorer, Sir Henry Stanley, had a defective hearing (the reviewer speaks from much personal knowledge), and not infrequently wrote down an incorrect version of the native name. No traveller subsequent to Stanley has been able to hear any native of eastern equatorial Africa say "Ruwendzori." Perhaps the nearest form to Stanley's rendering is Runsoro or Runsori (a considerable list of native names of this mountain mass is given in the reviewer's book on the Uganda Protectorate and in the monumental works published in connection with the Duke of the Abruzzi's expedition). But, however that may be, Ruwendzori has long been the form adopted by all Governments and all geographers of any note. Why, therefore, in the work under review should the author introduce a meaningless name of his own—Ru Nzori? There is no linguistic justification for this variant, and in looking through the index it is a matter of inconvenience to find the familiar name Ruwendzori absent.

In regard to the place-name Quelimane. Both the author and several geographical societies and map-makers are at fault. The author spells it phonetic-

ally as Kilimane, as though it was a native name. Other authorities give it as Quilimane. Neither is correct. As a matter of fact, the official Portuguese name is Quelimane, which is an ancient corruption of a Swahili-Arab word, Kalimani, meaning "interpreter." This was the nickname of some person who met the ships of Vasco da Gama or other Portuguese pioneers, and served as intermediary between them and the natives. If we are to continue to use the place-names "Moçambique" and "Inhambane," we have no recourse but to go on citing the name of this river mouth on the north of the Zambezi delta as Quelimane. If Mr. Knox desires that his work shall be perfect from the point of view of conformity with the best opinion in the rendering of African names in any further edition of the work, the spelling requires careful revision. The author points out his own spelling of Morocco as Marocco, as though it were preferable to the commonly accepted term. As the phonetic foundation for this name is really Marākesh, we do not seem to gain much by departing from the widely accepted English form, Morocco, unless we go the whole hog and call the land of the Moors either Marākesh or Maghrib-al-Aksa.

In the same way, appendix 1, a glossary of the principal vegetable productions of Africa, except timber trees, by Miss Mary S. Knox, also requires revision and a slight extension to be perfectly useful and unimpeachable. Under the heading of "Acacias" the information is too vague; no species of capsicum (chillies) is *native* to Egypt, the whole of this genus being of American origin. Under the head of "Coffee" nothing is said about the very important species, *Coffea libericensis*; and the assumption that there is but one species indigenous to or cultivated throughout tropical Africa, *Coffea arabica*, is quite incorrect and out of date. A reference to the works of Auguste Chevalier (amongst others) would enable Miss Knox to give much fuller and more useful information regarding the various species of coffee indigenous to tropical Africa and cultivated therein. It would be invidious to go on pointing out the errors in this appendix, but there are others. Yet it would be comparatively easy to make the whole appendix absolutely accurate and of great interest and importance in correlation with the main part of the book dealing with the African climate.

It is incorrect to say that the indigenous rubber of the Uganda Protectorate is "of poor quality." On the contrary, this protectorate is noteworthy for containing a large number of *Funtumia elastica* trees, which actually produce rubber attaining the highest value, when properly prepared, of any samples, even exceeding occasionally in price the best Para. Although a reference is made to the climate of Liberia (a region which, though small in extent, is very peculiar in flora and fauna—singularly so in fauna—and represents the culmination in rainfall of any part of real West Africa—as distinguished from Central Africa), the information is incomplete and old in date. Had the author glanced at the work on Liberia by the present reviewer, published in 1906, he would have found later and more complete statistics; and there is still further information in the reports and papers

published by M. Auguste Chevalier. In the parts dealing with Sierra Leone and Southern Nigeria, no reference seems to be made to the valuable rain and temperature records kept and published by (or under the direction of) Mr. Frederick Shelford, the chief engineer or constructor of the railways in those countries. Mr. Shelford has made his records sufficiently public in the papers of scientific societies for them to be easily accessible.

The maps contributed to this book by Mr. J. G. Bartholomew under the direction of the author are admirable, and great praise must be awarded to the author for his general research, the clearness with which he sets forth his details and his conclusions, and the way in which he has invested what might seem to be a somewhat uninteresting subject with an interest and an importance sufficient to attract the general reader as well as the specialist. The book, indeed, is so good that it ought to be made as perfect as possible in all its details, which is why the reviewer has expatiated more on these slight defects than on the general excellence of what should prove a standard work.

One last criticism, for the publishers. It might on the whole be better in future editions to paste the twelve maps on monthly rainfall into the body of the work. Although in some ways it is convenient to have them in a pocket and to handle them separately, they are very liable in library use to be lost.

H. H. JOHNSTON.

THE NEW ANIMAL PSYCHOLOGY.

Animal Intelligence: Experimental Studies. By E. L. Thorndike. Pp. viii+297. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1911.) Price 7s. net.

ONE of the most remarkable examples of sudden and rapid development of a new scientific method and a new and extensive body of scientific fact is to be seen in the growth of the study of animal psychology during the last ten or a dozen years. As in the case of the general science of psychology, the change came with the introduction of experiment as the fundamental method of investigation, but the transition was accentuated by a craving for objectivity of results, which focussed the attention upon the objective performance or behaviour of the animal under examination, not only to the detriment, but even, in the case of many observers, to the complete neglect of speculation as to its psychical life. If the new psychology claimed to be a psychology without a soul, the new animal psychology threatened, and still threatens, to become an animal psychology without consciousness. Many investigators have indeed openly declared for this ideal—not denying the presence of consciousness, but regarding it as of no importance or value in an explanatory scientific system. Nevertheless signs are not wanting in the most recent work of a healthy reaction from this extreme view, based as much upon observed fact as upon *a priori* speculation.

After the most detailed investigations have been made into the manifold relations of stimulus and

response presented by organisms, there is still room to be found for psychical factors of a greater or less degree of complexity, if the explanations are to be complete, although it is a sound principle of methodology that appeal should not be made to them until the possibilities of an exclusively mechanical or chemico-physical explanation have been exhausted. Indeed, it is the new experimental method that has succeeded in demonstrating, in certain cases, the existence of sensations not to be suspected from ordinary observation of the animal. Thus, fish do not ordinarily react to certain musical tones. If, however, such a musical tone is sounded repeatedly when food is supplied to the animal, the latter will ultimately respond to the sound by coming to be fed. In this case, as in many other similar cases, the existence of the sensation or its neural equivalent is demonstrated by the method of association.

Although the general tendency of the science is to become more and more closely assimilated to biology in its methods and explanatory hypotheses, its most marked characteristic at present is a certain distrust of the adequacy of the principle of natural selection to explain the facts, and a greater faith in physical, chemical, and physiological explanations. It shows an equal distrust for finalistic, and, in particular, anthropomorphic views, and is more ready to form its own scientific conceptions and seek the explanation of the more fundamental facts of human behaviour in them than conversely. Its scientific independence is well symbolised by the appearance in America, at the beginning of last year, of a new journal, *The Journal of Animal Behavior*, which is issued bi-monthly, and contains excellent and extremely interesting articles upon the modes of behaviour and (perhaps) consciousness of various kinds of animals. A very complex and efficient technique has been developed, which contrasts with the anecdotal method of the English school of the last generation almost as pronouncedly as do modern chemical methods with those of the mediæval alchemists. One must hasten to add, however, that the well-known works of Prof. Lloyd Morgan form an honourable exception to this method, and are, of course, exempt from the criticism.

In the case of the psychology of vertebrates, it is to Prof. E. L. Thorndike, of Columbia University, that the great credit is due of inaugurating the new methods of research and indicating those modes of experimentation which have met with such signal success at the hands of himself and his successors. The book on "Animal Intelligence" which he has just published is a reprint of four experimental studies already well known to the specialist, viz. "Animal Intelligence; an Experimental Study of the Associative Process in Animals" (first published in 1898), "The Instinctive Reactions of Young Chicks" (1899), "A Note on the Psychology of Fishes" (1899), and "The Mental Life of Monkeys" (1901), together with an interesting introductory chapter on "The Study of Consciousness and the Study of Behaviour," and two concluding chapters, also of a general character, headed "Laws and Hypotheses of Behaviour" and "The Evolution of the Human Intellect" respectively.